

SPECIFICATION

CASSETTE

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a supporting plate and a cassette using the same, and more particularly to a supporting plate used in transporting substrates.

2. Description of the Related Art

[0002] In handing substrates, such as glass substrates for LCDs, cassettes are useful for holding or stowing the substrates to keep them from contacting, and thus damaging each other.

[0003] A conventional cassette described in JP Yodogawa Kasei publication number H04-139741, comprises a pair of frames and a plurality of resin-made rods fixed to the frames. Moreover, the resin-made rod is provided with a plurality of annular slots for supporting substrates. In use, annular slots neighbor resin-made rods aren't successive, so the substrates to be inserted to the cassette may be slantways or be damaged.

[0004] Another conventional substrate-supporting side board of cassette described in US Yodogawa Kasei patent number 5,584,401, comprises a metal core, and overlay and a plurality of tongue-shaped shelf members extending from the overlay. The shelf members are in parallel and inwardly of the cassette frame with an upward inclination toward free ends thereof, the supporting surface of each shelf member being slightly elevated in the center with respect to its flanks. The tongue-shaped shelf member with protrusion in center made touch area between

the substrates and the shelf member decrease, but the substrates may be scraped to damage because the center protrusion must touch with middle acting part of the substrates, not edges of the substrates, to support the substrates, moreover it is difficult to insert the substrates to the right position due to the disconnecting supporting surface.

[0005] For the above reason, an improved cassette which is easy to insert the substrates to right positions without damage is desired.

SUMMARY OF THE INVENTION

[0006] An object of the invention is to provide a cassette which is easy to insert the substrates to right positions without damage.

[0007] In order to achieve the object set forth above, a cassette for accommodating the substrates comprises a pair of frames, and at least a pair of supporting plates fixed to the frames. Each two supporting plates face each other, and each supporting plate defines a plurality of wing panels on an inward facing side, each wing panel comprises a plurality of protrusions extending from a free side of each wing panel, and the wing panels slope down. Furthermore, the wing panels being so positioned that a group of wing panels in a same horizontal plane cooperate with each other to stow one substrate.

[0008] Due to this structure, when the substrates are inserted the space intervals between neighbor wing panels, the wing panels with the protrusion provide a guiding mechanism which can't make the substrates miss right positions, and on the right positions, the substrates are supported by a group of wing panels in a same horizontal plane and area of that the substrates touch with wing panels is only edges of the substrates.

[0009] Other objects, advantages and novel features of the invention will

become more apparent from the following detailed description of the preferred embodiment of the invention as illustrated in the accompanying drawings, in which:

BRIEF DESCRIPTION OF THE INVENTION

- [0010] FIG. 1 is a perspective view of a supporting plate according to the present invention;
- [0011] FIG. 2 is another perspective view of the supporting plate according to the present invention;
- [0012] FIG. 3 is a side plan view of the supporting plate of FIG. 1;
- [0013] FIG. 4 is a top plan view of the supporting plate of FIG. 1;
- [0014] FIG. 5 is a perspective view of a cassette with two pairs of supporting plates shown in FIG. 1;
- [0015] FIG. 6 is an explosive view of a part of the cassette shown in FIG. 5.

DETAILED DESCRIPTION OF THE INVENTION

- [0016] Reference will be made to the drawings to describe the invention in detail.
- [0017] Referring to FIG. 1 and FIG. 2, a supporting plate 10 according to the present invention is used in a cassette for accommodating substrates, and comprises a main body 11 and two stiff shafts 13. The main body 11 may be made of resin, such as, by injection molding. The main body 11 comprises a plurality of wing panels 15 extending from the main body 11, and the wing panels 15 are spaced apart from one another a predetermined distance. Each wing panel

15 provides a plurality of protrusions 151 extending from free side of each wing panel 15, and the wing panels 15 slope down. A space interval 17 is defined between neighboring wing panels 15, each space interval 17 provides at least a hole 171 through the main body 11 for dispersing heat and cutting the cost. The main body 11 further comprises two through grooves 18 (see FIG. 6) in back side of the main body 11 for receiving two stiff shafts 13 respectively, the through grooves 18 are formed perpendicularly basically to the wing panels 15. For holding the stiff shafts tightly, the through grooves 18 define a plurality of holding members 19 from two sides of the through grooves 18. The stiff shafts 13 may be made of metal, which can improve the strength of the supporting plate 11 and eliminate static electricity generated due to friction in the insertion or removal of the substrates. The stiff shafts 13 further comprises coupling ends 131 in each end, and defines threaded holes 135 in opposite end surface 133 thereof.

[0018] Referring to FIG. 3 and FIG. 4, the wing panels 15 slope down, that is to say, if a lower surface (not labeled) of each wing panel 15 is horizontal, thickness of each wing panel 15 gradually become thinner from root (not labeled) of each wing panel 15 to free end (not labeled) of each wing panel 15, so thickness of each protrusion 151 is thinnest. Surely, the lower surface can be sloped down as an upper surface does to make each wing panel 15 sloping down. Due to this structure, when the substrates are inserted the space intervals 17 between neighbor wing panels 15, the wing panels 15 with the protrusion 151 provide a guiding mechanism which can't make the substrates miss right positions, and on the right positions, the substrates are supported by a group of wing panels 15 in a same horizontal plane and area of that the substrates touch with wing panels 15 is only edges of the substrates 13.

[0019] FIG. 5 and FIG. 6 are shown a cassette 20 using the supporting plate 10 according to the present invention. The cassette 20 comprises a pair of frames 30

and at least a pair of supporting plates 10, the frames 30 and the supporting plates 10 form a space for accommodating substrates by the means of the stiff shafts 13 and a plurality of screws (not labeled). The frames 30 define a plurality of recesses 301 for coupling with the coupling ends 131 of the stiff shafts 13, and each recess 301 defines a threaded hole through the frame 30.

[0020] In assembly, wing panels 15 are face inward, the stiff shafts 13 are assembled with the supporting plates 10, and are received in the through grooves 18, the coupling ends 131 positioned in the recesses 301 respectively. A plurality of screws fixes the supporting plates 10 and the frames 30 through the threaded hole 303 and 135.

[0021] It is to be understood, however, than even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the extent indicated by the broad general meaning of the terms in which the appended claims are expressed.